

SUB A

Abstract

An all-lag correlator correlates a received spread-spectrum signal with a reference code and produces in each sampling instant N correlation lags corresponding to the correlation of the received signal with 0, 1, ..., $N-1$ lags (or delays) of the reference code, wherein N is the length of the reference code. The received signal, possibly embedded in noise and interference, consists of periodic replicas of the reference code with or without data modulation. Methods and apparatus for computing all-lag correlation sequence include a single correlator (a) which has the number of outputs equal to the length of the reference code and (b) whose outputs at one sampling instant are all correlation lags for the incoming SS signal samples and are produced at a rate equal to the rate of the incoming SS signal samples. A first embodiment of the present invention describes a method and apparatus of an all-lag correlator which is applicable to situations where data modulation is not present in the received signal. A second embodiment of the present invention describes a method and apparatus of an all-lag correlator which is applicable for situations where data modulation is present in the received signal. The apparatus includes storage means for storing spread-spectrum signal samples, subtraction means, a plurality of multiplication means each computing the multiplication result for the output of subtraction means and an element of the reference code, storage means for storing correlation lags, and a plurality of addition means.